high crest stages reached at the different ranches as part evidence, the following conclusions have been reached:

That apparently 20 inches or more rainfall occurred over a small area on Saco Creek, approximately 12 miles above D'Hanis, and that 12 inches or more occurred at other points, with an average amount exceeding 9 inches over the entire watershed of approximately 80 square miles, and that the time required for this rain was less than 3 hours.

It seems almost impossible for water to fall at so rapid a rate, but slope measurements made by the United States Geological Survey engineers indicate a discharge of 265,000 second-feet from an area of about 80 square miles. So far as known, this much exceeds any rate of flow from an area of this size.

In connection with the above report it is of interest that the cooperative observer at Sabinal, Tex., a short distance west of D'Hanis, reported 7.70 inches of rain, which fell between 5 a. m. and 11 a. m.; and the cooperative observer at Hondo, Tex., a short distance to the east of D'Hanis, reported 9.15 inches in the same period. Both Sabinal and Hondo lie outside of the Saco Creek Basin.

The discharge of 265,000 second-feet from 80 square miles is 3,312½ second-feet per square mile. Since a rate of rainfall of 1 inch per hour is equal to a discharge of 645⅓ second-feet per square mile there must have been a rate of rainfall of 5.13 inches per hour from the entire drainage area in order to produce the discharge calculated from the slope measurements. This is assuming that the soil became completely soaked and a steady state had been reached. Even at this very high rate of rainfall it is very doubtful if a steady state had been reached in the short time of 3 hours. Therefore, if the discharge calculated from the slope measurements is correct, a rate of rainfall considerably in excess of 5 inches per hour must have occurred.

Table of flood stages in August 1935

[All dates are in August unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
Saluda:	*Feet*			*Feet*	
Pelzer, S. C.	6	20	20	7.1	20
Chappells, S. C.	13	21	22	14.8	22
		25	27	17.2	26
Santee: Rimini, S. C.	12	22	24	13.0	24
Savannah: Ellenton, S. C.	14	22	26	16.2	24
MISSISSIPPI SYSTEM					
Missouri Basin					
Solomon: Beloit, Kans.	18	30	30	19.4	30
Ohio Basin					
Tygart: Elkins, W. Va.	14	8	8	14.6	8
Walhonding: Walhonding, Ohio	8	7	8	16.9	7
Tuscarawas:					
Newcomerstown, Ohio	16	7	11	21.2	9
Coshocton, Ohio	11	7	13	24.6	8
Muskingum:					
Lock No. 10, Zanesville, Ohio	25	8	12	33.6	9
Lock No. 7, McConnellsville, Ohio	22	8	13	32.8	9
Lock No. 3, Lowell, Ohio	25	9	12	30.3	10
Little Kanawha:					
Glenville, W. Va.	23	7	8	28.2	8
Creston, W. Va.	20	8	9	21.0	8
Gauley: Summersville, W. Va.	10	8	8	12.1	8
Arkansas basin					
Purgatoire: Higbee, Colo.	4	18	18	4.2	18
		29	29	5.0	29
Canadian: Union, Okla.	6	8	8	6.0	8
		31	31	7.0	31
WEST GULF OF MEXICO DRAINAGE					
Nueces: Cotulla, Tex.	15	July 29	1	18.6	July 30

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, W. F. McDONALD, in Charge]

NORTH ATLANTIC OCEAN

By H. C. HUNTER

Atmospheric pressure.—The pressure averaged moderately above normal near the British Isles; and, apart from waters near Iceland and east Greenland, was mainly a little above normal over the middle and eastern portions of the North Atlantic; also near the North American coast from Labrador to Virginia, save near Nova Scotia and southern Newfoundland where it was below normal. From Nova Scotia to the Bermuda region and thence southwestward to the Greater Antilles the pressure averaged below normal, while it was slightly below over the Gulf of Mexico and the east Florida coast.

The highest pressure thus far reported was 30.53 inches, by the American steamship *Exochorda*, about 10 p. m., the 25th, a short distance north of Horta. The lowest reading was in a hurricane area, about 27° N., 68° W., at 5 a. m., the 21st when the American steamship *Angelina* noted 28.20 inches. Apart from hurricane areas the lowest is 28.74 inches, by the Swedish motorship *Blankaholm*, at 3 a. m., the 21st, near 53° N., 38° W.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, August 1935*

Station	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland	29.75	.....	30.22	29	29.31	4
Reykjavik, Iceland	29.69	−0.12	30.06	30	29.28	8, 20
Lerwick, Shetland Islands	29.89	+.09	30.26	6	29.25	27
Valencia, Ireland	30.04	+.12	30.43	6	29.62	28
Lisbon, Portugal	30.01	−.01	30.17	2	29.77	29
Madeira	30.05	+.02	30.12	25	29.94	24
Horta, Azores	30.25	+.05	30.45	25	29.86	20
Belle Isle, Newfoundland	29.91	+.02	30.20	18, 19, 21, 23	29.28	3
Halifax, Nova Scotia	29.98	−.03	30.30	18	29.62	2, 25
Nantucket	30.02	+.03	30.31	19	29.65	1
Hatteras	30.00	.00	30.16	18	29.82	7
Bermuda	30.05	−.09	30.14	1, 18	29.68	23
Turks Island	29.97	−.07	30.07	2, 12	29.89	20
Key West	29.97	−.01	30.15	3	29.87	31
New Orleans	29.95	−.03	30.17	3	29.80	23

NOTE.—All data based on a. m. observations only, with departures compiled from best available normals related to time of observations, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

Cyclones and gales.—A LOW near Virginia on the 7th advanced over the ocean, first eastward, then toward

east-northeast, gaining strength during the 8th and 9th. The position of the center on the 10th was about 400 miles south of Newfoundland, and several steamers to westward of midocean reported gales; the greatest force, however, was only a strong gale (9). On the 11th and 12th the storm's course was more northerly, so it ceased to affect the chief steamship lanes.

Another LOW, central on the 16th near the southern tip of Greenland, gradually expanded to southward and eastward till it covered a large area; and for several days, especially the 19th to 21st, showed considerable strength. Numerous reports of gales encountered have been received from vessels then traversing the chief routes to northern Europe, between the 50th and 20th meridians. The American steamship *Scanpenn* reported the greatest force connected with this storm, namely 11. On the 22d and following days this storm withdrew to northeastward.

Tropical storms.—One West Indian hurricane passed through its whole life history during August 1935. Full discussion of the storm appears elsewhere in this issue, but reference is here made to the synoptic weather charts representing two stages of this storm's history. Chart IX, for August 18, illustrates the conditions existing over the Atlantic as the disturbance was emerging from the region of origin, advancing northwestward. On the night of the 18th the American motorship *California Standard* experienced whole gales, backing from northeast to southeast, near 23° N., 64° W., but the lowest barometer was only 29.55 inches.

On the morning of the 21st, as the storm was recurving northward, the American steamship *Angelina* recorded hurricane winds and a reading of 28.20 inches. Three days later the British freighter *York City* suffered considerable damage near the center, then about 36°30′ N., 59°30′ W. Chart X shows the situation on the 24th, when the center was near the *York City*, and gives also the approximate track of the center over its whole course.

During the 24th the storm turned northward near the 55th meridian, attended by heavy gales which caused much damage to fishing fleets and considerable loss of life over the Grand Banks and on the Newfoundland and Labrador coasts.

At the end of the month another tropical storm had appeared near the southeastern islands of the Bahama group. A full account of this will appear in the September REVIEW.

Fog.—Near the American coast from New Jersey to Nova Scotia and thence eastward between the fortieth and forty-fifth parallels there was much less fog than during July just preceding, no one 5° square in this strip showing more than 13 days. East of the forty-fifth meridian no fog whatever has been reported in this strip, although fog was more frequent than usual just to westward, over the southern Grand Banks region.

Between the forty-fifth and fiftieth parallels, from eastern Newfoundland to the twentieth meridian, fog was everywhere much more prevalent than usual during August, although it generally was not quite so common as it had been during July 1935. The greatest number of occurrences during August, 18 days, was noted not far east of Newfoundland, in the square 45° to 50° N., 45° to 50° W.

OCEAN GALES AND STORMS, AUGUST 1935

Vessel	Voyage		Position at time of lowest barometer		Gale began August—	Time of lowest barometer August—	Gale ended August—	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Inches*					
Tanamo, Am. S. S.	Alvaro Obregon.	Philadelphia	21 48 N.	90 23 W.	2	5p, 2	2	29.99	SE	SE, 8	SE	SE, 8	
Boston City, Br. S. S.	Swansea	Montreal	52 45 N.	50 24 W.	4	9a, 4	4	29.12	WSW	WNW, 8	WNW	WNW, 8	WSW-WNW.
Cardonia, Am. S. S.	Galveston	Barcelona	38 38 N.	63 46 W.	9	Noon, 9	9	29.48	NE	NE, 9	NNE	NE, 9	NE-NW.
Quistconck, Am. S. S.	New Orleans	Havre	40 30 N.	58 42 W.	9	2a, 10	11	29.30	SSE	SW, 8	WSW	WSW, 9	SSE-SW.
Bremen, Ger. S. S.	Cherbourg	New York	43 25 N.	51 54 W.	10	9p, 10	11	29.66	SSE	SSE, 5	WSW	S, 9	SSE-SW.
Makala, Belg. S. S.	Banana	Antwerp	43 58 N.	8 40 W.	12	6p, 12	13	29.76	N	NW, 5	N	N, 8	SW-NNW.
Northern Prince, Br. M. S.	Trinidad	New York	21 43 N.	65 00 W.	18	4p, 18	19	29.75	N	NNE, 6	ENE	ENE, 9	N-NNE-ENE.
California Standard, Am. M. S.	Cristobal	London	[1] 22 20 N.	64 00 W.	18	9p, 18	19	29.55	NE	NE, 11	SE	NE, 11	NE-ENE-SE.
General Greene, U. S. C. G.	Out from St. Johns.		58 37 N.	46 27 W.	20	9a, 20	20	29.35	ESE	SSE, 5	ENE	ENE, 9	SSE-ESE.
Blankaholm, Swed. M. S.	Gothenburg	New York	53 08 N.	38 30 W.	21	3a, 21	21	28.74	SW	SW, 9	NW	SW, 9	SW-NW.
Ponce, Am. S. S.	New York	San Juan	27 30 N.	66 45 W.	20	3a, 21	21	29.72	E	E, 9	S	SE, 10	E-SE.
Angelina, Am. S. S.	do	do	26 55 N.	68 30 W.	20	5a, 21	21	28.20	E	NE, 12	SW	W, 12	E-NE-W.
American Importer, Am. S. S.	Belfast	New York	50 37 N.	37 20 W.	21	6a, 21	21	29.34	SW	SW, 8	WNW	WNW, 10	SW-WNW.
Paul H. Harwood, Am. S. S.	New York	Aruba	[1] 26 38 N.	69 58 W.	20	7a, 21	21	28.54	NE	NW, 9	W	N, 10	NE-N-NW.
Champlain, Fr. S.	do	Havre	50 24 N.	26 06 W.	21	3p, 21	21	29.44	W	W, 8	W	W, 8	SW-W.
Lord Kelvin, Br. S. S.	Out from Falmouth.		50 15 N.	21 00 W.	21	6p, 21	23	29.54	SSW	SW, 8	NW	SSW, 9	SSW-WSW.
A. C. Bedford, Am. S. S.	Montreal	Cartagena	28 26 N.	66 24 W.	21	6p, 21	22	29.68	ESE	SE, 10	SSW	SE, 10	ESE-SE-S.
Scanpenn, Am. S. S.	Copenhagen	New York	57 32 N.	24 50 W.	21	Mdt., 21	22	28.78	SE	SE, 3	NW	NNW, 11	S-SE-NE.
Noreg, Nor. M. S.	Houston	Gibraltar	27 20 N.	71 40 W.	20	Mdt., 21	23	29.36	ENE	WNW, 10	WSW	W, 11	NW-W.
York City, Br. S. S.	Poti	Baltimore	[1] 36 30 N.	59 30 W.	23	5a, 24	24	[2] 28.71	S	S, 12	W	S, 12	SSE-S-NW.
Blankaholm, Swed. M. S.	Gothenburg	New York	45 25 N.	58 10 W.	24	11p, 24	25	28.86	ENE	NE, 8	W	W, 8	ENE-NW-N.
Waukegan, Am. S. S.	Havre	do	49 59 N.	12 00 W.	26	2p, 26	27	29.85	WSW	WNW, 8	WNW	WSW, 8	SW-WNW.
Hakonesan Maru, Jap. M. S.	Cristobal	do	22 55 N.	74 30 W.	31	8p, 31	Sept. 1	29.67	SW	S, 10	SE	S, 10	SW-S.

[1] Position approximate.

[2] Barometer uncorrected.